

# Joint USU & WRAIR Clinical Pharmacology Fellowship

Program Directors:

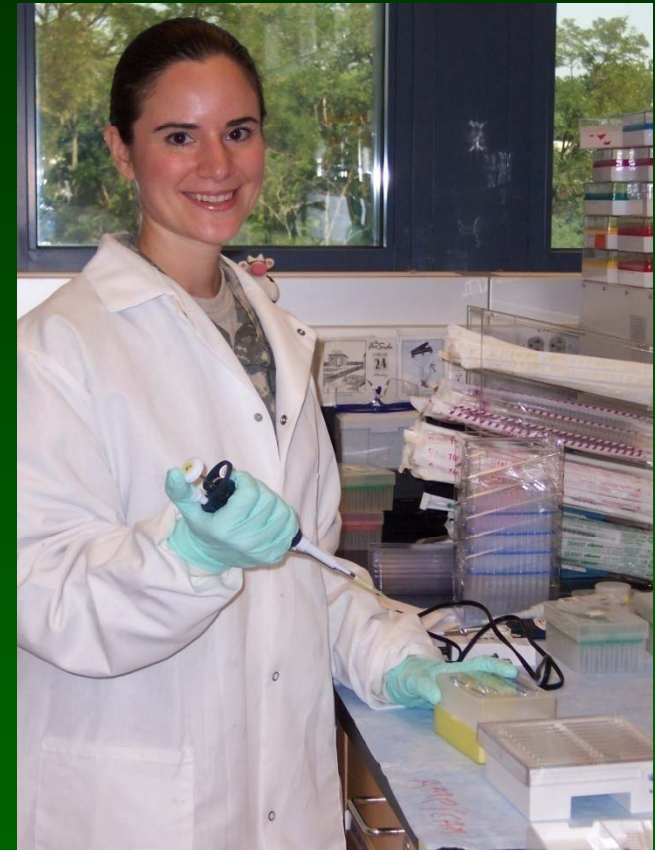
Louis Cantilena, MD, PhD

Colin Ohrt, MD, MPH; COL, MC



# Agenda

- Fellowship
  - History
  - Curriculum
  - Institutional Support
  - Faculty
- Recent Graduates
- Fellows
- Accomplishments



CPT Lanteri – to begin  
fellowship July 2009

# Clinical Pharmacology Fellowship

- Two-year program
- USU-WRAIR-FDA
- Fellowship Objectives
  - Train to be Clinical/Applied Pharmacologist
    - Clinical research
    - Drug development & approval
    - “Pharmacometrics”
    - Project leadership
    - “Translational medicine”
  - Board certification



MAJ Shon Remich giving 1<sup>st</sup>  
dose GMP artesunate  
overseas

# Fellowship History

- Established in 1980 by Carl Peck
- AMEDD GME/LTHET Fellowship
- FDA (1989 through 1997)
- ABCP accredited since 2004
- 38 fellows graduated
- Program Directors:
  - Dr. Louis Cantilena (USU, 1989)
  - COL Colin Ohrt (WRAIR, 2006)
    - Graduated from Fellowship in June 1997



Carl Peck, MD –  
went on to be  
Director CDER,  
FDA

# Fellowship Curriculum

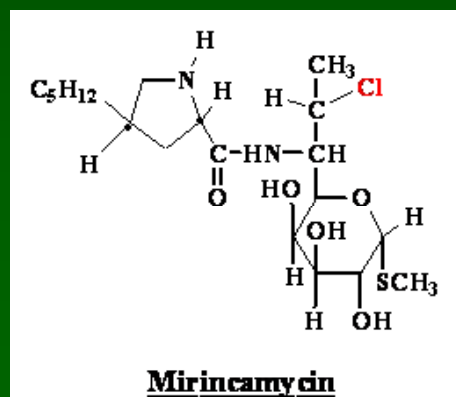
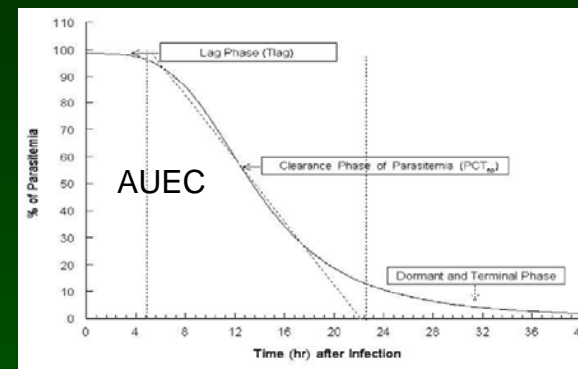
- Mentored research project
- Formal coursework
  - Principles of Clinical Pharmacology
  - Basic Pharmacology
  - Biostatics
  - Pharmacometrics
  - Ethical and Regulatory Aspects of Clinical Research
  - Introduction to the Principles and Practice of Clinical Research
  - Good Clinical Practices
- Participation in drug development teams
- Weekly Seminar/Journal Club/FDA Guidance Club
- Clinical consultations/teaching/CPU experience
- FDA rotation (3-4 months)



Educational Specialist

# Fellowship Research Project

- Select in 1<sup>st</sup> six months
- Militarily relevant (US Army fellows)
- Clinical pharmacology mentor
- Areas available
  - Identification of drug candidates
  - Animal efficacy and safety testing
  - Lead optimization
  - Phase 1-2 clinical trials
  - Drug metabolism
  - Pharmacokinetics & pharmacodynamics
  - Phase IV safety monitoring
- Back-up project strongly encouraged





# Institutional Support

- 3-Way MOU between WRAIR-USU-FDA
- Research projects/mentorship - all
- USU – lead for:
  - Medical student teaching
  - Clinical consultation
  - Clinical Pharmacology Unit
- WRAIR – lead for:
  - Coordinating formal course work
  - Product development teams
  - Weekly seminars
- FDA – lead for: regulatory experience

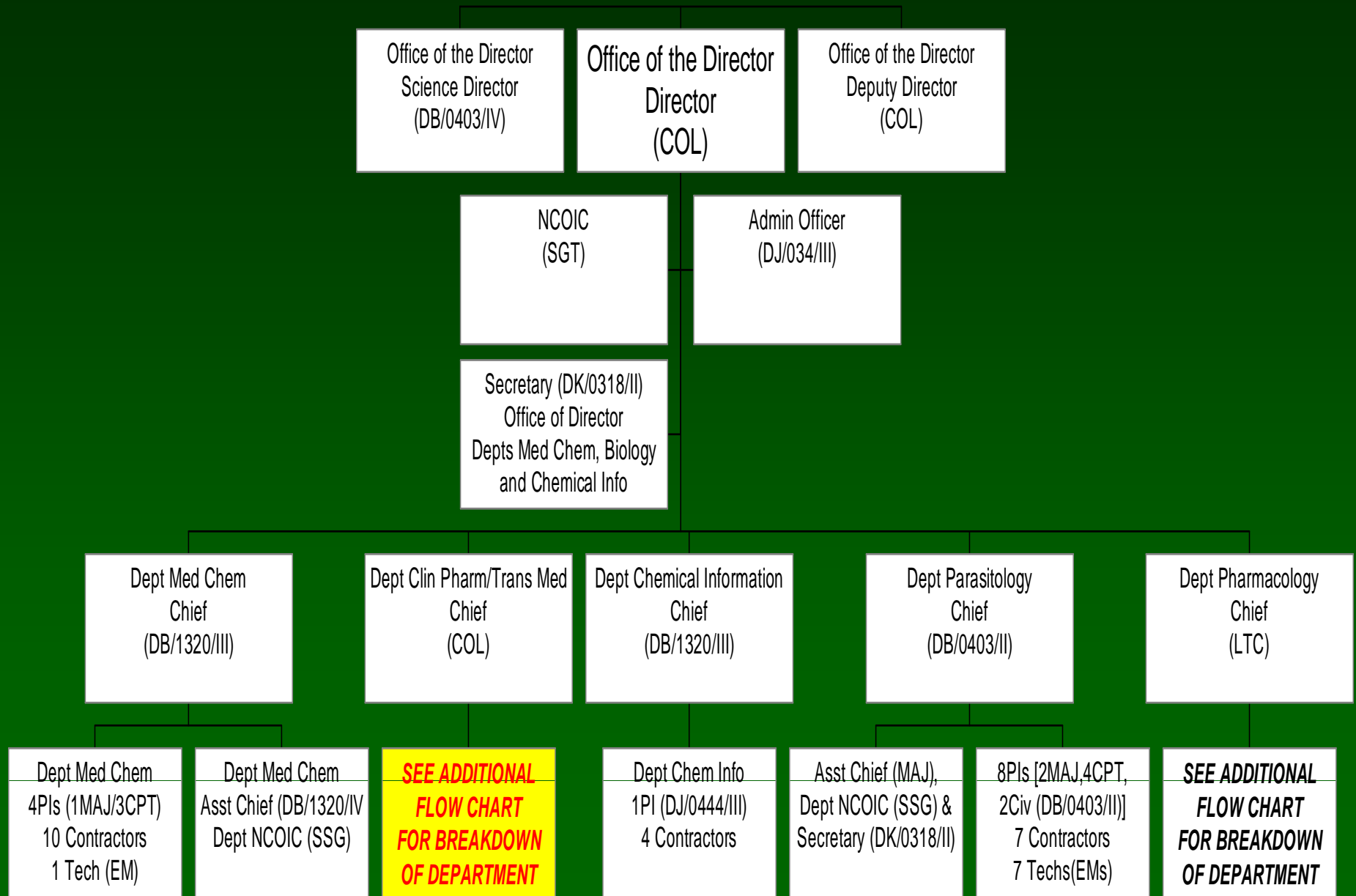


Uniformed Service University



Walter Reed Army Institute  
of Research

## Division of Experimental Therapeutic Organizational Chart





# Department of Clinical Pharmacology & Translational Medicine

## Organizational Chart

**COL Colin Ohrt**  
Department Chief  
Para 10C Ln 01

**Peggy Reinbold-Wasson**  
Education Specialist  
Clinical Research Management, Inc.  
Para 10C; Ln 34 (WRAIR TDA)

**Vacant**  
Department Assistant Chief  
Para 10D Ln 01; 71A67

**Vacant**  
Department NCOIC  
Para 10D Ln 07; 68K

**MAJ Kent Bennett**  
Acting Assistant Fellowship Program Director  
Para 10C Ln 03; 61E

**Vacant**  
Pharmacokinetics/Pharmacodynamics/Modelling  
Para 10D Ln 04; 67B00

**Vacant**  
Translational Medicine  
Para 10C Ln 03; 61E

**LtCol Gregory Deye**  
Clinical Operations  
Para 10C Ln 6; 61E

**Dr. Aruna Sampath**  
Coordinator  
Non-Hemolytic 8-Aminoquinoline  
Consortium

**COL Susan Fracisco**  
2nd Year 61E Fellow  
Para 10C Ln 08; 61E Fellow

**LTC Louis Macareo**  
2nd Year 61E Fellow  
Para 10C Ln 04; 61E Staff

**LTC Bryan Smith**  
1st Year 61E Fellow  
Para 10C Ln 10; 60C Resident

**MAJ Jurandir Dalle Lucca**  
1st Year MSC Fellow

**MAJ Hans Wei**  
1st Year MSC Fellow

**MAJ Charles DiTusa**  
MSC Fellow  
*To Begin in June 2009*

**CPT Charlotte Lanteri**  
MSC Fellow  
*To Begin in June 2009*

**Vacant**  
GME Fellow  
*To Begin in June 2009*

**Yarrow Rothstein**  
Data/Sample Management  
Clinical Research Management, Inc.  
Para 10D; Ln 11

**Vacant**  
Technician  
Para 10D; Ln 08 68K

**Vacant**  
Technician  
Para 10D; Ln 08 68K

**Vacant**  
Technician  
Para 10D; Ln 09 68K

**Dr. Hla Myint**  
~~Pharmacovigilance~~  
Non-Hemolytic 8-Aminoquinoline

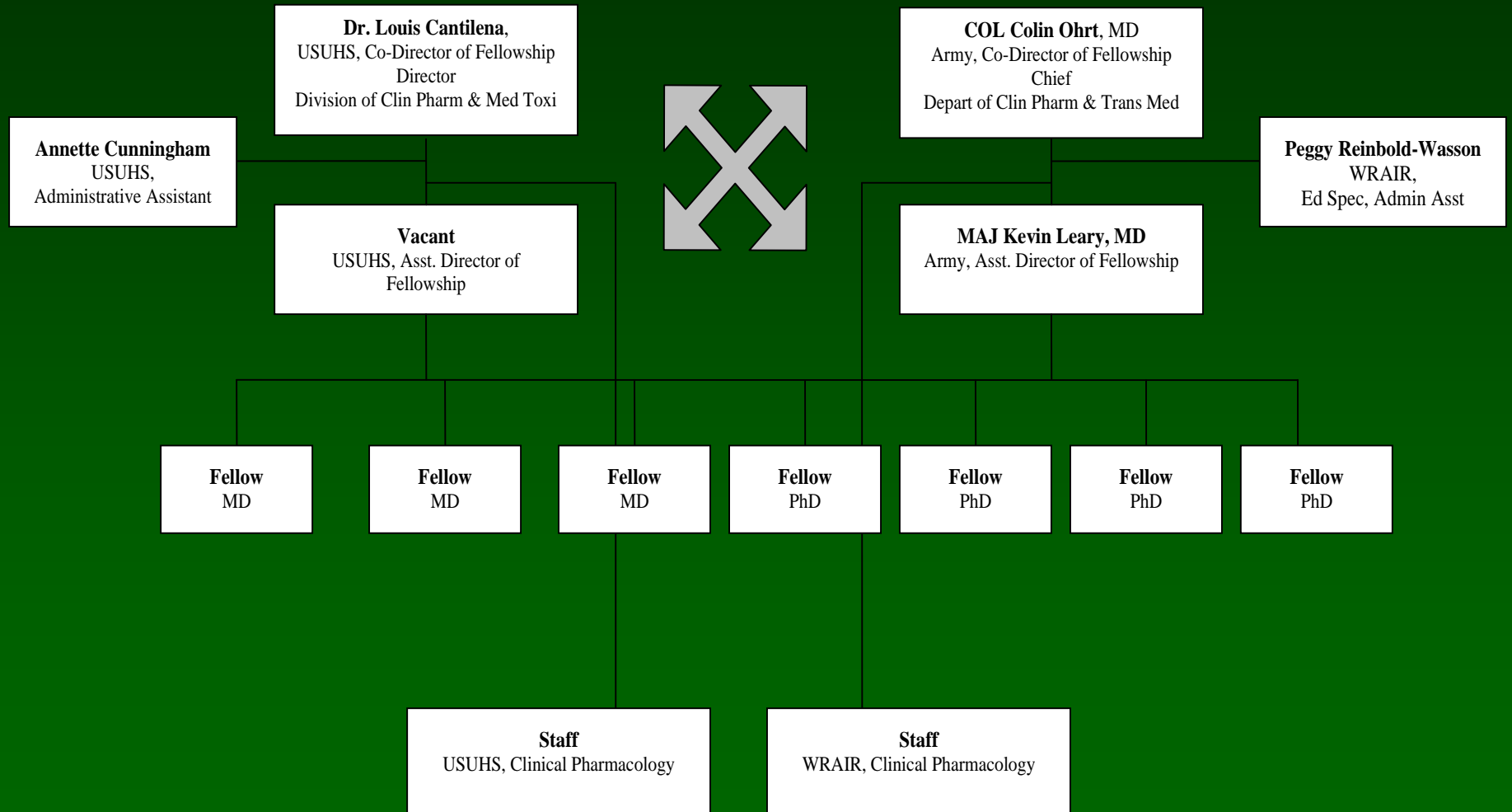
**Military Officers (green)**  
**Military Enlisted (blue)**  
**GS Personnel (red)**  
**Contract Personnel (black)**

Previous Copy (13 Oct 07)  
From: FY09 DA TDA  
Effective 0109

Date prepared: 14 Jan 09

# Clinical Pharmacology Fellowship Organizational Chart

12 February 2009



# Financial Support

- Army P8 (training)
  - ~\$105K/year
  - + Educational Specialist salary
- Army P6 (research)
  - ~\$8M/year (MIDRP)
  - External grants ~\$2-4M/year
  - Division of Experimental Therapeutics
  - Supports fellowship projects
- USU funding
  - Prior funding since 1990: NIH, FDA, US Army, and Industry \$26M
  - Currently: NCCAM (NIH) \$1.6M

# Clinical Pharmacology Fellowship

- Accredited by ABCP in 2004
  - Reaccreditation in 2009
  - Internal review (2006)
    - Needs identified
    - Being implemented



# Core Fellowship Faculty

## Program Directors:

- Louis R. Cantilena, Jr., MD, PhD
  - Professor, Medicine and Pharmacology, USU
  - USU Clinical Pharmacology Fellowship Program Co-Director
  - Director, Division of Clinical Pharmacology and Medical Toxicology
  - ABCP Board Diplomate of Clinical Pharmacology, 1991
- Colin K. Ohrt, MD, MPH; COL, MC
  - Adjunct Associate Professor, USU
  - WRAIR Clinical Pharmacology Fellowship Program Co-Director
  - Consultant to the Surgeon General for Clinical Pharmacology
  - Chief, Department of Clinical Pharmacology and Translational Medicine
  - ABCP Board Diplomate of Clinical Pharmacology, 2003

## USUHS Affiliated Core Faculty:

- Gerald H. Sokol, MD
  - Adjunct Associate Professor, Medicine
  - ABCP Board Diplomate of Clinical Pharmacology, 1991

# Core Fellowship Faculty

## WRAIR Affiliated Core Faculty:

- Kevin J. Leary, MD; MAJ, MC\*\*
  - Adjunct Assistant Professor, USU
  - ABCP Board Diplomate of Clinical Pharmacology, 2007
- Kent S. Bennett, DO, PharmD, MPH; MAJ, MC\*\*
  - Lecturer, Clinical Pharmacology and Preventive Medicine
  - Taking the ABCP Boards in 2009 if allowed to leave deployment
- R. Scott Miller, MD; COL, MC\*\*
  - Adjunct Assistant Professor, USU
- David Saunders, MD, MPH; MAJ, MC\*\*
  - Adjunct Assistant Professor, USU
  - Taking the ABCP Boards in 2009
- Trinka Coster, MD; COL, MC
- Kevin Cannard, MD, FAAN; (ret) COL, MC\*\*
  - Associate Professor of Neurology and Medicine (Clinical Pharmacology), USU
  - ABCP Board Diplomate of Clinical Pharmacology, 2007

\*\*Indicates faculty who were not on the 2004 Accreditation Application



# Adjunct Fellowship Faculty

## USU Affiliated Adjunct Faculty:

- Daoqin Bi, MD
- Jerry M. Collins, PhD
  - ABCP Board Diplomate of Clinical Pharmacology, Charter
- Charles J. Ganley, MD
- Diane K. Jorkasky, MD
  - ABCP Board Diplomate of Clinical Pharmacology, 1992
- Daniel A. Spyker, MD, PhD
  - ABCP Board Diplomate of Clinical Pharmacology, 1991
- Curtis Wright IV, MD, MPH
  - ABCP Board Diplomate of Clinical Pharmacology, 1991

## WRAIR Affiliated Adjunct Faculty:

- Ralf P. Brueckner, MD<sup>^</sup>
- Gregory A. Deye, MD; LtCol, MC<sup>\*\*</sup>
- Geoffrey S. Dow, PhD<sup>\*\*</sup>
- Steven R. Gitterman, MD, PhD<sup>\*\*</sup>
- Shiew-Mei Huang, PhD, FCP<sup>\*\*</sup>
  - ABCP Board Diplomate of Applied Pharmacology, 2001
- Alan J. Magill, MD, FACP, FIDSA; COL, MC<sup>\*\*</sup>
- Kirsten S. Smith, PhD; MAJ, MS<sup>\*\*</sup>

<sup>\*\*</sup>Indicates faculty who were not on the 2004 Accreditation Application  
<sup>^</sup>Former Co-Director of Clinical Pharmacology Fellowship Program

# Recent Graduates

- David Saunders, MAJ, MC
  - Graduated 2008
  - Posted at AFRIMS, Thailand
- Kent Bennett, MAJ, MC
  - Graduated 2007
  - Posted at WRAIR
- Kevin Cannard, (ret) COL, MC
  - Graduated 2006
  - Now GS civilian at WRAMC/NNMC
- Kevin Leary, MAJ, MC
  - Graduated 2005
  - Posted at USAMMDA, Ft. Detrick



MAJ David Saunders  
in Afghanistan before fellowship



MAJ Kevin Leary  
in Iraq

# Fellows

- Second year
  - Susan Francisco, COL, MC
  - Louis Macareo, LTC, MC
- First year
  - Bryan Smith, LTC, MC
  - Jurandir (JJ) DalleLucca, MAJ, MS
  - Hans Wei, MAJ, MS
- Starting in July 2009
  - Charles (Chuck) DiTusa, MAJ, MS
  - Charlotte Lanteri, CPT, MS



# Clinical Pharmacology Fellowship Graduate

| <b>Years</b> | <b>Fellow</b>             | <b>Date Started</b> | <b>Date Graduated</b> | <b>CP/AP Board Certified</b> | <b>From</b>                   |
|--------------|---------------------------|---------------------|-----------------------|------------------------------|-------------------------------|
| 80 - 81      | Stambler, Nancy - MS      | 1-JUL-80            | 30-JUN-81             |                              | was a USUHS MS Student        |
| 80 - 81      | Perlin, Elliot - MD       | 1-JUL-80            | 30-JUN-81             | 1993                         | was stationed USN, NNMC       |
| 81 - 83      | Mell, Leroy - PhD         | 1-JUL-81            | 30-JUN-83             |                              | was stationed USN, NNRC       |
| 81 - 84      | Ezra, David - MD          | 1-JUL-81            | 30-JUN-84             |                              | was from U.Tel Aviv, Israel   |
| 82 - 83      | Platzer, Rudi - MD        | 1-JUL-82            | 30-JUN-83             |                              | was from U. Bern, Switzerland |
| 82 - 84      | Shmuklarsky, Mosha - MD   | 1-JUL-82            | 30-JUN-84             |                              | was from UCSF                 |
| 83 - 83      | Perkins, Stanley - MD     | 1-JAN-83            | 30-DEC-83             |                              | was from WRAIR                |
| 83 - 84      | Chen, Benjamin - MD       | 1-JUL-83            | 30-JUN-84             |                              | was from UCSF                 |
| 84 - 86      | Haim, Nitin - MD          | 1-JUL-84            | 30-JUN-86             |                              | was from U.Tel Aviv, Israel   |
| 85 - 87      | Hill, Vincent - MD        | 1-JUL-81            | 30-JUN-83             |                              | was from Howard U.            |
| 85 - 88      | Fleischer, Nicholas - PhD | 1-JUL-85            | 30-JUN-88             |                              | was from USUHS                |
| 86 - 87      | Lehmann, Craig - PharmD   | 1-JUL-86            | 30-JUN-87             |                              | was from USAF                 |

# Clinical Pharmacology Fellowship Graduate

| Years   | Fellow                            | Date Started | Date Graduated | CP/AP Board Certified | From                  | Primary Specialty          | Sub-Specialty |
|---------|-----------------------------------|--------------|----------------|-----------------------|-----------------------|----------------------------|---------------|
| 81 - 82 | Berenberg, Jeffry - MD            | 1-JUL-81     | 30-JUN-82      |                       |                       | Oncology                   |               |
| 86 - 88 | Murphy, Gail - MD                 | 1-JUL-86     | 30-JUN-88      |                       | Industry              | Pediatrics                 | Neonatology   |
| 88 - 90 | Brueckner, Ralf - MD              | 1-JUL-88     | 30-JUN-90      |                       | Industry              | Pediatrics                 |               |
| 90 - 92 | Ferguson, Clifford - MD           | 1-JUL-90     | 30-JUN-92      |                       | Academics             | Internal Medicine          | Nephrology    |
| 90 - 92 | Oleshansky, Marvin - MD           | 1-JUL-90     | 30-JUN-92      | 1994                  | WRAMC                 | Psychiatry                 |               |
| 91 - 93 | Marino, Mark - MD                 | 1-JUL-91     | 30-JUN-93      |                       | Industry              | Internal Medicine          |               |
| 91 - 94 | Geraci, Stephen - MD              | 1-JUL-91     | 30-JUN-94      |                       | Academics             | Internal Medicine          | Cardiology    |
| 91 - 94 | Honig, Peter - MD                 | 1-JUL-91     | 30-JUN-94      |                       | Industry              |                            |               |
| 92 - 94 | Wesche, David - MD                | 1-JUL-92     | 30-JUN-94      |                       | Industry              | Internal Medicine          |               |
| 92 - 95 | Graumlich, James - MD             | 1 JUL-92     | 30-JUN-95      |                       | Academics             | Internal Medicine          |               |
| 93 - 95 | Hough, David - MD                 | 1-JUL-93     | 30-JUN-95      |                       | Clinical Practice     | Psychiatry                 |               |
| 93 - 96 | Goldman, Steve                    | 1-JUL-93     | 30-JUN-96      |                       | Industry, Consultants | Psychiatry                 |               |
| 94 - 96 | Leo-Uhl, Kathleen - MD            | 1-JUL-94     | 30-JUN-96      |                       | FDA                   | Family Practice            |               |
| 95 - 97 | Kieffer, Lydia - PharmD           | 1-JUL-95     | 30-JUN-97      |                       | FDA                   |                            |               |
| 95 - 97 | Ohrt, Colin - MD<br>(Co-Director) | 1-JUL-95     | 30-JUN-97      | 2003                  | WRAIR                 | Internal Medicine          |               |
| 95 - 98 | Pavlova, Tatiana-MD, PhD          | 1-JUL-95     | 30-JUN-98      |                       | Academics             | Obstetrics-Gyn, Pediatrics |               |
| 96 - 98 | Bonner, Mark - MD                 | 1-JUL-96     | 30-JUN-98      |                       | Private Practice      | Dermatology                |               |

# Clinical Pharmacology Fellowship Graduate

| <b>Years</b> | <b>Fellow</b>              | <b>Date Started</b> | <b>Date Graduated</b> | <b>CP/AP Board Certified</b> | <b>From</b>                            | <b>Primary Specialty</b> | <b>Sub-Specialty</b> |
|--------------|----------------------------|---------------------|-----------------------|------------------------------|--|--------------------------|----------------------|
| 00 - 02      | Remich, Shon - MD          | 1-SEP-00            | 31-AUG-02             |                              | WRAMC                                  | Pediatrics               | Allergy/Immun.       |
| 00 - 02      | Riel, Michael - MD         | 1-JUL-00            | 30-JUN-02             |                              | Private Practice                       | Internal Medicine        | Gastroenterology     |
| 01 - 03      | Coster, Trinka - MD        | 1-JAN-01            | 31-DEC-03             |                              | OTSG                                   | Internal Medicine        |                      |
| 02 - 04      | Barker, Tamra - MD         | 1-JUL-02            | 30-JUN-04             |                              | Private Practice                       | Preventive Medicine      |                      |
| 02 - 04      | Medlock, Matthew - MD      | 1-JUL-02            | 30-JUN-04             | 2005                         | Industry                               | Internal Medicine        |                      |
| 03 - 05      | Leary, Kevin - MD          | 1-JUL-03            | 30-JUN-05             | 2007                         | USAMMDA                                | Internal Medicine        |                      |
| 04 - 06      | Cannard, Kevin - MD        | 1-JUL-04            | 30-JUN-06             | 2007                         | USUHS                                  | Neurology                | Move. Disorders      |
| 05 - 07      | Bennett, Kent - DO         | 1-JUL-05            | 30-JUN-07             |                              | WRAIR, ET                              | Preventive Medicine      |                      |
| 06 - 08      | Saunders, David - MD       | 1-JUL-06            | 30-JUN-08             |                              | AFRIMS                                 | Internal Medicine        |                      |
| 07 - 09      | Fracisco, Susan - MD       | 1-JUL-07            | 30-JUN-09             |                              | WRAIR, Current MD Fellow               | Psychiatry               | Child Psychiatry     |
| 07 - 09      | Macareo, Louis - MD        | 1-JUL-07            | 30-JUN-09             |                              | WRAIR, Current MD Fellow               | Internal Medicine        |                      |
| 08 - 10      | Smith, Bryan - MD          | 1-JUL-08            | 30-JUN-10             |                              | WRAIR, Current MD Fellow               | Family Practice          |                      |
| 08 - 10      | DalleLucca, Jurandir - PhD | 1-JUL-08            | 30-JUN-10             |                              | WRAIR, Current PhD Fellow              |                          |                      |
| 08 - 10      | Wei, Hans - PhD            | 1-JUL-08            | 30-JUN-10             |                              | WRAIR, Current PhD Fellow              |                          |                      |
| 09 - 11      | DiTusa, Charles - PhD      | 1-JUL-09            | 30-JUN-11             |                              | WRAIR, PhD Fellow starting in July '09 |                          |                      |
| 09 - 11      | Lanteri, Charlotte - PhD   | 1-JUL-09            | 30-JUN-11             |                              | WRAIR, PhD Fellow starting in July '09 |                          |                      |



# Accomplishments

- Academic Productivity
  - Abstracts: 35 by 24 fellows
  - Publications: 48 by 24 fellows\*
    - 26 1<sup>st</sup> Authors
    - 6 2<sup>nd</sup> Authors
    - 4 Last Authors
    - 3 1<sup>st</sup> Author In Progress

\*How Journals were counted:

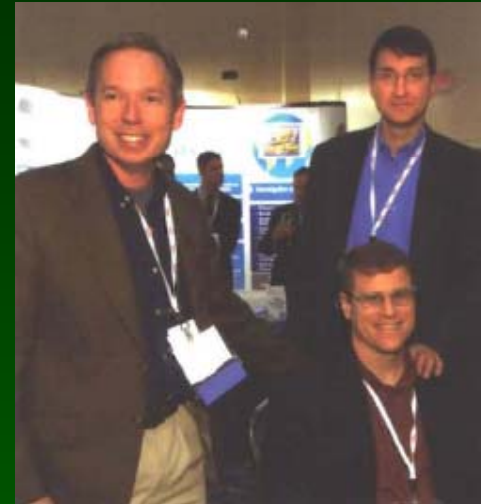
--1<sup>st</sup> Year of Fellowship: only counted journal articles in the first year of fellowship if they had published in a Clinical Pharmacology Journal

--2<sup>nd</sup> Year of Fellowship: Counted all of these journal articles except Commentaries

--1 Year following Fellowship: Counted these journal articles except Commentaries as most Fellows publish there work their 1<sup>st</sup> year out

# Recent Accomplishments

- Fellows/Staff
  - Passed boards
    - MAJ Leary
    - COL Cannard
  - Awards
    - MAJ Saunders MSM for fellowship projects
    - MAJ Bennett ARCOM for fellowship projects
  - Grant Funding
    - \$1.3M MMV grant (Fracisco)
    - Mirincamycin advanced to A4 project



# David Saunders, MAJ, MC

- Fellowship Project

- Primary:

- Buccal Fentanyl vs IV morphine
      - Six visit cross-over design
      - Screened over 100 subjects
      - 200 study subject admissions

- Secondary:

- Doxycycline tolerability in 10<sup>th</sup> Mountain Division
    - Leishmaniasis mouse model development
    - IZ pharmacokinetics/team support
  - Mentors: Dr. Cantilena, COL Magill
  - Meritorious Service Medal for Fellow Projects/Activities



# Susan Fracisco, COL, MC

- Fellowship Project
  - Secondary: Surrogate endpoint for malaria prevention trials
    - Led several aspects
    - Late breaker abstract ASCPT
  - Primary: Mirincamycin as radical cure for malaria
    - Awarded \$450K MMV funding year one (\$1.3M total)
    - Presented historical & mouse data @ ASTMH
    - Confirmatory Rhesus study @ AFRIMS Feb 09
    - Five publications planned
    - Leading new A4 project
  - Mentors: COL Ohrt, COL Magill, Dr. Carl Craft

# Susan Francisco, COL, MC

- To be posted at USU July 09
  - Medical student – clin pharm teaching
  - Consultation service
  - 75% FTE WRAIR/Fellowship
    - Project leadership
      - Mirincamycin
      - Macrolide analog
    - Fellowship mentorship
    - Recruiting



# Louis Macareo, LTC, MC

- Fellowship Project
  - Primary: Tinidazole for radical cure of *P. vivax*
    - Study recently initiated in Thailand
    - 40 days out, no relapses!
  - Secondary: PK-PD IV artesunate
  - Directly Supporting IV AS Team
  - Mentors: COL Miller, Dr. Li
- To be posted at WRAIR
  - Fellowship mentorship
  - Translational medicine
  - Clinical research
  - Overseas laboratory support
  - Recruiting
  - Mentors: COL Miller, COL Ohrt





# Bryan Smith, LTC, MC

- Began 1 July 08
- Arrived from AFRIMS
- Fellowship Project
  - Primary
    - Mefloquine analogs in Aotus monkeys
    - Directly supporting Next Generation Quinoline Methanol team
  - Secondary: TBD
  - Mentors: Dr. Geoff Dow/Dr. Cantilena



# Hans Wei, MAJ, MS

- Began 1 July 08
- Arrived from WRAIR Neurosciences
- Fellowship Project
  - Primary
    - G6PD-deficient Rhesus model
    - Directly supporting Non-hemolytic 8AQ team
  - Secondary: Antimalarial potentiation of primaquine
  - Mentors: LtCol Deye, COL Ohrt



# WRAIR DIV ET Anti-Malarial Drug Product Portfolio

## Technology Readiness Assessment (TRL) Levels

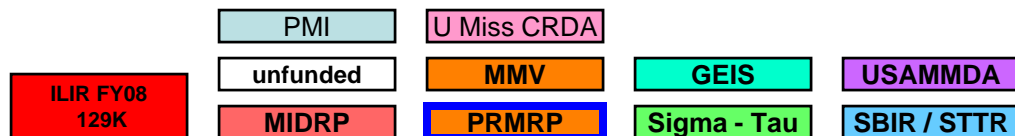
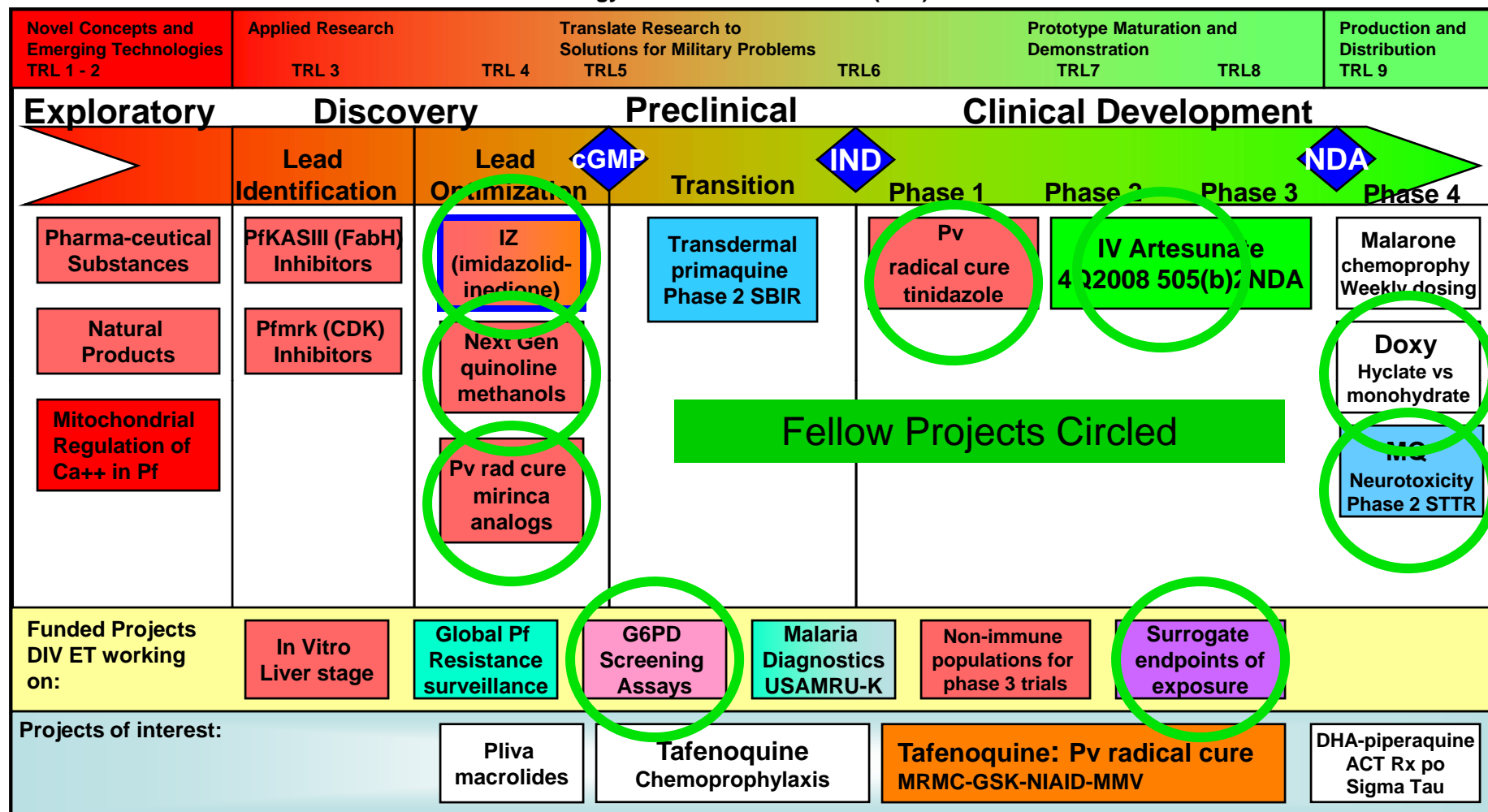
| Novel Concepts and Emerging Technologies<br>TRL 1 - 2 | Applied Research<br>TRL 3  | Translate Research to Solutions for Military Problems<br>TRL 4<br>TRL 5 | Prototype Maturation and Demonstration<br>TRL 6<br>TRL 7 | Production and Distribution<br>TRL 8<br>TRL 9   |
|---|----------------------------|---|--|---|
| Exploratory   | Discovery                  | Preclinical   | Clinical Development                                     |   |
|   | Lead Identification        | Lead Optimization   | Transition   | Phase 1<br>Phase 2<br>Phase 3<br>Phase 4        |
| Pharma-ceutical Substances                            | PfKASIII (FabH) Inhibitors | IZ (imidazolidinedione)   | Transdermal primaquine Phase 2 SBIR                      | Pv radical cure tinidazole                      |
| Natural Products                                      | Pfmrk (CDK) Inhibitors     | Next Gen quinoline methanols  |  | IV Artesunate 4Q2008 505(b)2NDA                 |
| Mitochondrial Regulation of Ca++ in Pf                |                            | Pv rad cure mirinca analogs   |  | Malarone chemoprophylaxis Weekly dosing         |
|   |                            |   |  | Doxy Hyclate vs monohydrate                     |
|   |                            |   |  | MQ Neurotoxicity Phase 2 STTR                   |
| Funded Projects DIV ET working on:                    | In Vitro Liver stage       | Global Pf Resistance surveillance                                       | G6PD Screening Assays                                    | Malaria Diagnostics USAMRU-K                    |
|   |                            |   |  | Non-immune populations for phase 3 trials       |
|   |                            |   |  | Surrogate endpoints of exposure                 |
| Projects of interest:                                 |                            | Pliva macrolides  | Tafenoquine Chemoprophylaxis                             | Tafenoquine: Pv radical cure MRMC-GSK-NIAID-MMV |
|   |                            |   |  | DHA-piperaquine ACT Rx po Sigma Tau             |

|                |          |             |
|----------------|----------|-------------|
| ILIR FY08 129K | PMI      | U Miss CRDA |
|                | unfunded | MMV         |
|                | MIDRP    | PRMRP       |
|                |          | GEIS        |
|                |          | Sigma - Tau |
|                |          | USAMMDA     |
|                |          | SBIR / STTR |

ILIR - In-House Laboratory Independent Research (DoD)  
MIDRP - Military Infectious Disease Research Program (DoD)  
MMV - Medicines for Malaria Venture  
PRMRP - Peer Reviewed Medical Research Program (DoD)  
SBIR - Small Business Innovative Research / technology transfer  
USAMMDA - United States Army Medical Material Development Activity

# WRAIR DIV ET Anti-Malarial Drug Product Portfolio

## Technology Readiness Assessment (TRL) Levels



ILIR - In-House Laboratory Independent Research (DoD)  
 MIDRP - Military Infectious Disease Research Program (DoD)  
 MMV - Medicines for Malaria Venture  
 PRMRP - Peer Reviewed Medical Research Program (DoD)  
 SBIR - Small Business Innovative Research / technology transfer  
 USAMMDA - United States Army Medical Material Development Activity

# Current & Recent Fellowship Resources

- P8
  - Travel, courses, meetings, computers, software, library, recruiting
  - Educational Specialist
- P6
  - Tinidazole (\$120K)
  - Mirincamycin (<\$100K)
  - Quinoline methanols Aotus (unused contract \$\$)
- CRDA
  - Mirincamycin (\$1.3M)
  - Rhesus G6PD (~\$300K)
- Other
  - Surrogate markers (USAMMDA)
  - Saunders main (USU CRDA)
  - Complement inhibitor (RAD 4)

# Clinical Pharmacology in Army

- Current Authorizations (11)
  - WRAIR
  - USU
  - USAMMDA (Ft. Detrick)
  - AFRIMS (Thailand)
  - USAMRU-Kenya
- Requested Authorizations
  - All MRMCC laboratories
  - New Walter Reed National Military Medical Center